

COPY

**COPY OF PAPERS
ORIGINALLY FILED**

What is claimed is:

1. A temporary sealing element for forming a fluid-tight conduit within a fluid conduit within a patient's body, the temporary sealing element comprising:

a tubular conduit having spaced ends and a protrusion formed intermediate the spaced ends, the tubular conduit including a region of diminished shear strength extending from the lateral protrusion along a path about the periphery of the tubular conduit to each of the spaced ends thereof for selectively reconfiguring the tubular conduit in response to tension applied to the protrusion to disassemble the tubular conduit into at least one continuous strand along the region from the protrusion.

2. The temporary sealing element according to claim 1 including a strand of material integrally forming the protrusion and contiguously wound segments of the tubular conduit between the spaced ends thereof, with successive convolutes extending remotely from the protrusion to the spaced ends, and with each convolute adhering to adjacent convolutes along lateral edges thereof to form the tubular conduit.

3. The temporary sealing element according to claim 2 in which the strand of material that forms the protrusion and tubular conduit includes

bioinert thermoplastic material and includes thermoplastic adhesion between contiguous edges of adjacent convolutes of the helically-wound strand.

4. The temporary sealing element according to claim 2 in which the thermoplastic material is polyvinyl chloride.

5. The temporary sealing element according to claim 2 including a removal tube overlaying the protrusion and selectively positionable against the tubular conduit to facilitate exertion of tensile force on the protrusion relative to the removal tube in position against the tubular conduit.

6. The temporary sealing element according to claim 1 in which the tubular conduit is formed of flexible resilient material and includes a generally cylindrical cross section between the spaced ends, and the protrusion is integrally formed therewith.

7. The temporary sealing element according to claim 6 in which the region of diminished shear strength extends from the protrusion along a meandering path to the spaced ends of the tubular conduit.

8. The temporary sealing element according to claim 6 in which the region of diminished shear strength extends from the protrusion along a substantially helical path to the spaced ends of the tubular conduit.

9. A seal removal instrument for the temporary sealing element of claim 5 including an elongated hollow tube having a lumen therethrough

between distal and proximal ends dimensioned to pass the protrusion and the strand of material therethrough;

said tube being positionable about the protrusion with the distal end of the tube disposed adjacent the tubular conduit for engaging the protrusion to exert tensile force thereon relative to the tube for extracting the protrusion and strand through the tube as a continuous strand.

10. A method for using a temporary fluid-conducting shunt past an aperture in a wall of a fluid-carrying vessel in a patient's body, the method comprising:

introducing through the aperture and into the vessel a resilient, flexible tubular conduit having a lateral protrusion disposed intermediate spaced ends and having a continuous disassociation region formed thereon to extend from the protrusion to the spaced ends;

positioning the tubular conduit within the vessel in fluid-sealing engagement within the vessel, with the protrusion disposed through the aperture;

substantially completing a surgical procedure about the aperture in the fluid-carrying vessel, retaining an incomplete segment overlapping the protrusion for removal of the tubular conduit;

disassembling the tubular conduit along the disassociation region extending from the protrusion for removal thereof as a continuous strand through the incomplete segment; and

completing the surgical procedure on the fluid-carrying vessel including along the incomplete segment following removal of the strand therethrough.

11. The method according to claim 10 in which substantially completing a surgical procedure includes stitching a suture through a wall of the fluid-carrying vessel about the aperture, with the protrusion of the tubular conduit extending through the aperture near a stitch of the suture;

disassembling the tubular conduit along the disassociation region thereof for withdrawal as a continuous strand through the aperture near the stitch of the suture; and

completing the surgical procedure to inhibit loss of blood through the aperture following removal of the continuous strand.

12. The method according to claim 11 in which disassembling the tubular conduit includes introducing a tube over the protrusion near the stitch of the suture with a distal end of the tube in engagement with the tubular conduit; and

exerting tensile force on the protrusion relative to the tube to pull therethrough the protrusion and subsequent portions of the tubular conduit as disassembled into a continuous strand along the disassociation region.

13. The method according to claim 10 in which the disassociation region extends along a helical path between the protrusion and a spaced end of the tubular conduit.

14. The method according to claim 10 in which the dissociation region extends along a serpentine path between the protrusion and a spaced end of the tubular element.

15. The method according to claim 13 in which the dissociation region extends along helical paths with substantially uniform pitch between the protrusion and the spaced ends of the tubular conduit.

16. The method according to claim 13 in which the dissociation region extends along helical paths in opposite rotational orientations between the protrusion and the spaced ends of the tubular conduit.

17. The method according to claim 10 in which the ends of the tubular conduit are spaced at different distances from the protrusion.

18. The method according to claim 10 in which the segments of tubular conduit extend with selected tubular cross sections from the protrusion toward the spaced ends.

19. The method according to claim 18 in which the tubular cross section is larger near at least one of the spaced ends than near the protrusion.

20. The method according to claim 18 in which the tubular cross section varies between the spaced ends.

21. A method for forming a tubular conduit for insertion and removal with respect to a fluid-carrying vessel of a patient, the method comprising:

forming a tubular conduit having a fluid-impervious wall extending longitudinally between spaced ends thereof; and including

forming a continuous disassociation region in the fluid-impervious wall along a path between the spaced ends.

22. The method according to claim 21 including

forming the tubular conduit as a coil of a continuous strand with substantially contiguous adjacent convolutes and with a protrusion of the strand integral therewith along the continuous dissociation region at a location intermediate the spaced ends.

23. The method according to claim 22 including

forming the protrusion as a loop near a central region of the tubular conduit for exerting tensile force thereon.

24. The method according to claim 21 in which the tubular conduit is formed as a helically-wound strand of material including a thermoplastic polymer disposed at contiguous lateral edges of adjacent convolutes; and selectively heating and pressing together the lateral edges of contiguous convolutes to lightly adhere the convolutes to form the fluid-impervious tubular conduit.

25. The method according to claim 21 in which the tubular conduit is formed with a continuous disassociation pattern of reduced thickness between the spaced ends for promoting disassembly of the tubular conduit along the disassociation pattern into a continuous strand in response to tensile force applied to the strand relative to the tubular conduit.

26. The method according to claim 21 in which the tubular conduit is formed as a strand of material disposed along a substantially serpentine path between the spaced ends and about the periphery of the tubular conduit.

27. The method according to claim 21 in which the tubular conduit is formed as a strand of material disposed along a continuous path between spaced ends of the tubular conduit with adjacent portions of the strand disposed in substantially contiguous orientation along the continuous path; and

the adjacent portions of the strand are coated with a flexible layer of substantially fluid-impervious material.

28. The method according to claim 27 in which the continuous path includes a loop of material laterally oriented relative to the tubular conduit at a location thereon intermediate the spaced ends.

29. A method of forming a temporary fluid-impervious tubular conduit comprising:

configuring a strand along a path between spaced ends of the tubular conduit; and

adhering contiguous adjacent segments of the strand along the path to form the fluid-impervious tubular conduit.

30. The method according to claim 29 in which the path is substantially helical between the spaced ends with adjacent convolutes of the strand disposed in substantially contiguous array along the path.

31. The method according to claim 29 in which the strand includes thermoplastic material; and

adhering includes applying heat and pressure to the strand disposed along the tubular conduit to flow the material into fluid impervious attachments of contiguous adjacent convolutes of the strand.

32. The method according to claim 29 in which the path is helical at substantially uniform pitch between the spaced ends.

33. The method according to claim 29 in which the path forms the tubular conduit of substantially uniform tubular cross section between the spaced ends.

34. The method according to claim 29 in which the path forms the tubular conduit with selected cross sections therealong between the spaced ends.

35. The method according to claim 34 in which the tubular cross section is greater at least near one of the spaced ends than the tubular cross section at a location intermediate the spaced ends.

36. The method according to claim 34 in which the tubular cross section varies between the spaced ends.

37. A method for manipulating a temporary fluid-tight shunt about an aperture in a wall of a fluid-carrying vessel in the body of a patient, the method comprising:

introducing through the aperture a tubular conduit having a protrusion extending from the tubular conduit in a central region between spaced ends thereof to establish fluid-tight engagements of the spaced ends with inner walls of the vessel; and

exerting tensile force on the protrusion through the aperture for disassembling the tubular conduit along a continuous path between the protrusion and each of the spaced ends for removal as a single continuous strand through the aperture.

38. The method according to claim 37 including:

positioning a tube over the protrusion with a distal end of the tube disposed adjacent the tubular conduit; and

exerting the tensile force on the protrusion relative to the tube for removing the continuous strand therethrough.